AMENDMENTS TO THE CLAIMS

Claim 1 (currently amended) A tuning method ~~for tuning a signal from a channelized spectrum having a predetermined channel spacing, the method~~ comprising:

(a) mixing a ~~signal~~ channel of interest from a channelized spectrum having a predetermined channel spacing with a first local oscillator signal;

(b) wherein the first local oscillator signal has a first frequency that is (1) one-half of a channel spacing displaced from an integer multiple of the channel spacing, and (2) ~~is~~ selected to frequency translate the ~~signal~~ channel of interest to within a ~~near-baseband~~ passband whose lower edge is spaced from DC by about the channel spacing and whose width is about the channel spacing ~~defined with reference to a lower frequency F1 and an upper frequency F2, wherein F1=F2-F1;~~ ~~whereby problems associated with 1/f noise, DC offsets, and self-mixing products are avoided or substantially diminished~~.

Claim 2 (currently amended) The method of claim 1 wherein the ~~signal~~ channel of interest has a predetermined maximum bandwidth less than the channel spacing~~and the near-baseband passband has a lower edge that is spaced from DC by at least about that maximum bandwidth~~.

Claim 3 (currently amended) The method of claim 2 further comprising:

(a) mixing the ~~signal~~ channel of interest with a second local oscillator signal having the first frequency and being approximately in quadrature with the first local oscillator signal;

(b) wherein the ~~signal~~ channel of interest lies within one of an upper high frequency spectrum of interest and a lower high frequency spectrum of interest; and

(c) the method further comprises providing spectrum coverage within one of the high frequency spectra of interest and not the other.

Claim 4 (original) The method of claim 3 further comprising coarse-tuning the local oscillator signal by one local oscillator step from the first frequency to a second frequency an integral number of channel spacings from the first frequency.

Claims 5-6 (canceled)

Claim 7 (currently amended) The method of claim 1 further comprising mixing the ~~signal~~ channel of interest with a second local oscillator signal having the first frequency and being approximately in quadrature with the first local oscillator signal.

Claim 8 (original) The method of claim 1 further comprising coarse-tuning the local oscillator signal by one local oscillator step from the first frequency to a second frequency an integral number of channel spacings from the first frequency.

Claim 9 (original) The method of claim 8 wherein the second frequency is two channel spacings from the first frequency.

Claim 10 (currently amended) The method of claim 1 wherein:

(a) the ~~signal~~ channel of interest lies within one of an upper high frequency spectrum of interest and a lower high frequency spectrum of interest; and

(b) the method further comprises providing spectrum coverage within one of the high frequency spectra of interest and not the other.

Claim 11 (original) The method of claim 10 further comprising switching between:

(a) providing spectrum coverage within the lower high frequency spectrum of interest and not the upper high frequency spectrum of interest; and

(b) providing spectrum coverage within the upper high frequency spectrum of interest and not the lower high frequency spectrum of interest.

Claim 12 (currently amended) Apparatus for tuning, from a channelized spectrum having a predetermined channel spacing, a ~~signal~~ channel of interest, the apparatus comprising:

(a) a local oscillator configured to generate a local oscillator signal at a first frequency that is one-half of ~~a~~ the channel spacing displaced from an integer multiple of the channel spacing; and

(b) a mixer responsive to the local oscillator signal and the ~~signal~~ channel of interest, wherein the mixer frequency translates the ~~signal~~ channel of interest;

(c) wherein the frequency-translated ~~signal~~ channel of interest falls within a ~~near-baseband~~ passband that is about a channel spacing wide and that is spaced from DC by a frequency offset of about the channel spacing~~defined with reference to a lower frequency F1 and an upper frequency F2, wherein F1=F2-F1;~~

~~whereby problems associated with 1/f noise, DC offsets, and self-mixing products are avoided or substantially diminished~~.

Claim 13 (currently amended) The apparatus of claim 12 wherein the ~~signal~~ channel of interest has a predetermined maximum bandwidth less than the channel spacing ~~and the near-baseband passband falls within a near-baseband passband spaced from DC by a frequency offset of at least about that maximum bandwidth~~.

Claim 14 (currently amended) The apparatus of claim 13 further comprising:

(a) a second local oscillator configured to generate a second local oscillator signal having the first frequency and being approximately in quadrature with the first local oscillator signal; and

(b) a second mixer responsive to the second local oscillator signal and the ~~signal~~ <u>channel</u> of interest, wherein:

(1) the ~~signal~~ <u>channel</u> of interest lies within one of an upper high frequency spectrum of interest and a lower high frequency spectrum of interest; and

(2) the apparatus provides spectrum coverage within one of the high frequency spectra of interest and not the other.

Claims 15-16 (canceled)

Claim 17 (original) The apparatus of claim 12 further comprising a second local oscillator configured to generate a second local oscillator signal having the first frequency and being approximately in quadrature with the first local oscillator signal.

Claim 18 (currently amended) The apparatus of claim 17 further comprising a second mixer responsive to the second local oscillator signal and the ~~signal~~ channel of interest, wherein:

(a) the ~~signal~~ channel of interest lies within one of an upper high frequency spectrum of interest and a lower high frequency spectrum of interest; and

(b) the apparatus provides spectrum coverage within one of the high frequency spectra of interest and not the other.

Claim 19 (currently amended) Apparatus for tuning, from a channelized spectrum having a predetermined channel spacing, a ~~signal~~ channel of interest ~~having a predetermined maximum bandwidth~~, the apparatus comprising:

(a) a local oscillator configured to generate a first local oscillator signal at a first frequency that is an integer multiple of the channel spacing and a second local oscillator signal having the first frequency and being approximately in quadrature with the first local oscillator signal; and

(b) a pair of mixers, each responsive to (1) a respective one of the local oscillator signals and (2) the ~~signal~~ channel of interest, wherein the mixers frequency translate the ~~signal~~ channel of interest;

(c) wherein the frequency-translated ~~signal~~ channel of interest falls within a near-baseband passband spaced from DC by a frequency offset of at least about the ~~maximum bandwidth of the signal of interest~~ channel spacing.

Claim 20 (currently amended) The apparatus of claim 19 wherein the spacing of the lower edge of the near-baseband passband from DC is greater than the ~~passband's width~~ channel spacing.

Claim 21 (original) The apparatus of claim 20 wherein the spacing of the lower edge of the near-baseband passband from DC is about twice the channel spacing.

Claim 22 (currently amended) The apparatus of claim 19 wherein:

(a) the ~~signal~~ channel of interest lies within one of an upper high frequency spectrum of interest and a lower high frequency spectrum of interest; and

(b) the apparatus provides spectrum coverage within one of the high frequency spectra of interest and not the other.

Claim 23 (currently amended) A method for tuning a channelized signal of interest from within a channelized spectrum, the method comprising:

(a) splitting an incoming signal into two signal paths;

(b) generating an approximately quadrature local oscillator signal from a local oscillator that is coarse-tunable across the channelized spectrum with a step size [[S]] that is an integer multiple of the channel spacing;

(c) quadrature mixing the split incoming signal with the local oscillator signal, thereby:

(1) frequency translating to a near-baseband passband an upper high frequency spectrum of interest from above the frequency of the local oscillator signal and a lower high frequency spectrum of interest from below the frequency of the local oscillator signal, the near-baseband passband being spaced from DC by at least about the ~~passband's width~~ channel spacing; and

(2) producing I and Q signals in approximate quadrature relation;

(d) limiting the frequency spectrum of the I and Q signals, wherein spectrum coverage is provided of a selected one of the high frequency spectra of interest and analog processing of signals at or close to DC is avoided; and

(e) repeating (a) through (d) in turn for a plurality of local oscillator frequencies, wherein high frequency spectra of interest tunable with the local oscillator frequencies of the plurality are interspersed among local oscillator frequencies of the plurality within the channelized spectrum.

Claim 24 (canceled)

Claim 25 (currently amended) The method of claim 23 wherein the near-baseband passband is sized to fit one channel <u>spacing</u>.

Claim 26 (previously presented) The method of claim 23 further comprising providing spectrum coverage within one of the high frequency spectra of interest and not the other.

Claim 27 (currently amended) The method of claim 23 wherein the spacing of the lower edge of the near-baseband passband from DC is greater than the ~~passband's width~~ <u>channel spacing</u>.

Claim 28 (currently amended) The method of claim 27 wherein the spacing of the lower edge of the near-baseband passband from DC is about twice the ~~passband's width~~ <u>channel spacing</u>.

Claim 29 (original) The method of claim 23 wherein limiting the frequency spectrum of the I and Q signals comprises filtering the signals in continuous-time using switched-capacitor circuitry.

Claim 30 (currently amended) The method of claim 23 wherein the near-baseband passband is defined with reference to a lower frequency F1 and an upper frequency F2, wherein F1=F2-F1 <u>and F2-F1 is about an integer multiple of channel spacings</u>.

Claims 31-32 (canceled)

Claim 33 (original) The method of claim 23 wherein limiting the frequency spectrum of the I and Q signals comprises highpass and lowpass filtering the signals in continuous-time.

Claim 34 (original) The method of claim 33 wherein limiting the frequency spectrum of the I and Q signals comprises filtering the signals in continuous-time using switched-capacitor circuitry.

Claim 35 (original) The method of claim 33 wherein limiting the frequency spectrum of the I and Q signals further comprises filtering the signals in discrete-time.

Claim 36 (original) The method of claim 23 further comprising providing spectrum coverage within one of the high frequency spectra of interest and not the other.

Claim 37 (original) The method of claim 36 further comprising:

(a) converting the I and Q signals to digital I and Q signals; and

(b) combining the digital I and Q signals to reject an undesired mixing image.

Claim 38 (original) The method of claim 37 further comprising correcting amplitude and phase errors between the digital I and Q signals.

Claim 39 (currently amended) Apparatus for tuning a channelized signal of interest from within a channelized spectrum having a predetermined channel spacing, the apparatus comprising:

(a) an RF amplifier responsive to an incoming signal;

(b) a local oscillator that is coarse-tunable across the channelized spectrum with a step size [[S]] that is an integer multiple of the channel spacing to a plurality of local oscillator frequencies;

(c) first and second filters defining a near-baseband passband spaced from DC by about an integer multiple of the channel spacing;

(d) first and second mixers, responsive to an amplified signal from the RF amplifier and an approximately quadrature local oscillator signal from the local oscillator, ~~wherein: (1) the first and second mixers~~ that ~~cooperatively~~ frequency translate to [[a]] the near-baseband passband (1) an upper high frequency spectrum of interest from above the frequency of the local oscillator signal, and (2) a lower high frequency spectrum of interest from below the frequency of the local oscillator signal; ~~(2) the near-baseband passband is spaced from DC by at least about the passband's width~~; and

(~~3~~e) a selector structured to ~~spectrum coverage is provided of a~~ select[[ed]] one of the high frequency spectra of interest~~; and~~

~~(d) first and second filters responsive to signals from the first and second mixers, respectively, wherein analog processing of signals at or close to DC is avoided;~~

~~(e) wherein high frequency spectra of interest tunable with the local oscillator frequencies of the plurality are interspersed among local oscillator frequencies of the plurality within the channelized spectrum~~.

Claim 40 (canceled)

Claim 41 (currently amended) The apparatus of claim 39 wherein the near-baseband passband is sized to fit one channel spacing.

Claim 42-43 (canceled)

Claim 44 (currently amended) The apparatus of claim [[43]] 39 wherein the spacing of the lower edge of the near-baseband passband from DC is about twice the ~~passband's width~~ channel spacing.

Claim 45 (canceled)

Claim 46 (original) The apparatus of claim 39 wherein the filters include continuous-time switched-capacitor circuitry.

Claim 47 (currently amended) The apparatus of claim 39 wherein the near-baseband passband is spaced from DC by about the channel spacing~~defined with reference to a lower frequency F1 and an upper frequency F2, wherein F1=F2-F1~~ and is about an integer multiple of the channel spacing wide.

Claim 48 (canceled)

Claim 49 (currently amended) The apparatus of claim [[48]] 47 wherein the spacing of the lower edge of the near-baseband passband from DC is about twice the ~~passband's width~~ channel spacing.

Claim 50 (original) The apparatus of claim 39 wherein the filters include continuous-time highpass and lowpass filters.

Claim 51 (original) The apparatus of claim 50 wherein the filters further include continuous-time switched-capacitor circuitry.

Claim 52 (currently amended) The apparatus of claim 39 ~~futher~~ further comprising discrete-time filters.

Claim 53 (previously presented) The method of claim 26 further comprising providing spectrum coverage within the upper high frequency spectrum of interest at one time and providing spectrum coverage within the lower high frequency spectrum of interest at a different time.

Claim 54 (currently amended) A ~~method for~~ tuning ~~a signal from a channelized spectrum, the~~ method comprising:

(a) mixing a ~~signal~~ channel of interest from a channelized spectrum with a first local oscillator signal; and

(b) ~~passband~~ filtering the mixed signal to define a near-baseband passband that is (1) sized to fit one channel spacing, and (2) has a lower edge spaced from DC by ~~at least~~ about an integer multiple of the ~~passband's width~~ channel spacing or a half-channel-spacing displaced from about an integer multiple of the channel spacing~~; and~~

~~(c) repeating parts (a) and (b) for a plurality of different local oscillator frequencies~~.

Claim 55 (currently amended) The method of claim 54 wherein the ~~near-baseband~~ passband is situated near baseband but sufficiently far from DC to substantially avoid 1/f noise.

Claims 56-57 (canceled)

Claim 58 (currently amended) The ~~apparatus~~ method of claim [[57]] 54 wherein the ~~spacing of the~~ lower edge of the near-baseband passband is spaced from DC ~~is~~ by about twice the ~~passband's width~~ channel spacing.

Claim 59 (currently amended) The method of claim 54 further comprising:

(a) splitting the incoming signal into two signal paths; and

(b) quadrature mixing the split incoming signal with the first local oscillator signal and a second local oscillator signal approximately in quadrature with the first local oscillator signal~~; and~~

~~(c) performing image rejection subsequent to the quadrature mixing~~.

Claim 60 (currently amended) The method of claim 59 ~~wherein~~ further comprising ~~performing image rejection comprises~~ performing digital image rejection.

Claim 61 (currently amended) The method of claim 54 further comprising~~:~~

~~(a) situating the near-baseband passband to substantially avoid 1/f noise of a power spectral density curve having a width comparable to that of the passband;~~

~~(b) splitting the incoming channels into two signal paths;~~

~~(c) quadrature mixing the split incoming channel with the first local oscillator signal and a second local oscillator signal approximately in quadrature with the first local oscillator signal; and~~

~~(d)~~ performing the image rejection ~~subsequent to~~ after the quadrature mixing.

Claims 62 (canceled)

Claim 63 (currently amended) The method of claim [[62]] 61 wherein the ~~spacing of the~~ lower edge of the near-baseband passband is spaced from DC ~~is~~ by about twice the ~~passband's width~~ channel spacing.

Claim 64 (canceled)

Claim 65 (currently amended) A method for tuning a signal channel of interest, comprising:

(a) receiving a ~~signal~~ channel of interest ~~having a predetermined maximum bandwidth~~ from a channelized spectrum having a predetermined channel spacing, wherein the channel of interest has a predetermined maximum bandwidth less than the channel spacing;

(b) producing I and Q signals in approximate quadrature relation by mixing the ~~signal~~ channel with an approximately quadrature local oscillator signal having a first frequency that is an integer multiple of the channel spacing; and

(c) defining a near-baseband passband whose lower edge is spaced from DC by at least about the ~~maximum bandwidth of the signal of interest~~ channel spacing, by passband filtering the I and Q signals.

Claims 66-68 (canceled)

Claim 69 (previously presented) The method of claim 65 further comprising coarse-tuning the local oscillator signal by one local oscillator step from the first frequency to a second frequency an integral number of channel spacings from the first frequency.

Claim 70 (previously presented) The method of claim 69 wherein the second frequency is two channel spacings from the first frequency.

Claims 71-72 (canceled)

Claim 73 (previously presented) The method of claim 65 wherein passband filtering the I and Q signals comprises filtering the signals in continuous-time using switched-capacitor circuitry.

Claim 74 (currently amended) A method for tuning a channel of interest, comprising:

(a) receiving a ~~signal~~ channel of interest ~~having a predetermined maximum bandwidth~~ from a channelized spectrum having a predetermined channel spacing, wherein the channel of interest has a predetermined maximum bandwidth less than the channel spacing;

(b) producing I and Q signals in approximate quadrature relation by mixing ~~a signal~~ the channel of interest ~~having a predetermined maximum bandwidth~~ with an approximately quadrature local oscillator signal having a first frequency that is one-half of a channel spacing displaced from an integer multiple of the channel spacing; and

(c) defining a near-baseband passband ~~defined with reference to a lower frequency F1 and an upper frequency F2, wherein F1=F2-F1~~ whose lower edge is spaced from DC by an integer multiple of the channel spacing, by passband filtering the I and Q signals.

Claims 75-76 (canceled)

Claim 77 (previously presented) The method of claim 74 further comprising coarse-tuning the local oscillator signal by one local oscillator step from the first frequency to a second frequency an integral number of channel spacings from the first frequency.

Claim 78 (previously presented) The method of claim 77 wherein the second frequency is two channel spacings from the first frequency.

Claims 79-80 (canceled)

Claim 81 (previously presented) The method of claim 74 wherein passband filtering the I and Q signals comprises filtering the signals in continuous-time using switched-capacitor circuitry.

Claim 82 (new) The apparatus of claim 19 further comprising a digital circuit that substantially rejects the image.

Claim 83 (new) A method for tuning a channel from a channelized spectrum having predetermined channel spacing, the method comprising:

(a) mixing a channel of interest with a first local oscillator signal;

(b) wherein the first local oscillator signal has a first frequency that (1) is an integer multiple of the channel spacing and (2) is selected to frequency translate the channel of interest to within a near-baseband passband whose lower edge is spaced from DC by at least about the channel spacing.

Claim 84 (new) The method of claim 83 further comprising spacing the near-baseband passband's lower edge from DC by about 1.5 times the channel spacing.

Claim 85 (new) The method of claim 83 further comprising mixing the channel of interest with a second local oscillator signal having the first frequency and being approximately in quadrature with the first local oscillator signal.

Claim 86 (new) The method of claim 83 further comprising coarse-tuning the local oscillator signal by one local oscillator step from the first frequency to a second frequency an integral number of channel spacings from the first frequency.

Claim 87 (new) The method of claim 86 wherein the second frequency is two channel spacings from the first frequency.

Claim 88 (new) The method of claim 83 wherein:

(a) the channel of interest lies within one of an upper high frequency spectrum of interest and a lower high frequency spectrum of interest; and

(b) the method further comprises providing spectrum coverage within one of the high frequency spectra of interest and not the other.

Claim 89 (new) The method of claim 88 further comprising switching between:

(a) providing spectrum coverage within the lower high frequency spectrum of interest and not the upper high frequency spectrum of interest; and

(b) providing spectrum coverage within the upper high frequency spectrum of interest and not the lower high frequency spectrum of interest.

Claim 90 (new) The method of claim 83 wherein the spacing of the lower edge of the near-baseband passband from DC is greater than the channel spacing.

Claim 91 (new) The method of claim 90 wherein the spacing of the lower edge of the near-baseband passband from DC is about twice the channel spacing.

Claim 92 (new) Apparatus for tuning, from a channelized spectrum having a predetermined channel spacing, a channel of interest, the apparatus comprising:

(a) a local oscillator configured to generate a local oscillator signal at a frequency that is an integer multiple of the channel spacing; and

(b) a mixer responsive to the local oscillator signal and the channel of interest, wherein the mixer frequency translates the channel of interest;

(c) wherein the frequency-translated channel of interest falls within a near-baseband passband spaced from DC by a frequency offset of at least about the channel spacing.

Claim 93 (new) The apparatus of claim 92 wherein the spacing of the lower edge of the near-baseband passband from DC is greater than the channel spacing.

Claim 94 (new) The apparatus of claim 93 wherein the spacing of the lower edge of the near-baseband passband from DC is about 1.5 times the channel spacing.

Claim 95 (new) The apparatus of claim 93 wherein the spacing of the lower edge of the near-baseband passband from DC is about twice the channel spacing.

Claim 96 (new) The apparatus of claim 92 wherein the local oscillator is coarse-tunable to generate a frequency that is two channel spacings away from the frequency of the desired channel to be tuned.

Claim 97 (new) The method of claim 54 further comprising repeating parts (a) and (b) for a plurality of different local oscillator frequencies.

Claim 98 (new) The method of claim 54 wherein the lower edge of the near-baseband passband is spaced from DC by about the channel spacing.

Claim 99 (new) The method of claim 54 wherein the lower edge of the near-baseband passband is spaced from DC by about 1.5 times the channel spacing.

Claim 100 (new) The method of claim 54 wherein the lower edge of the near-baseband passband is spaced from DC by about an integer multiple of the channel spacing.

Claim 101 (new) The method of claim 54 wherein the lower edge of the near-baseband passband is spaced from DC by an integer multiple of the channel spacing.

Claim 102 (new) The method of claim 54 wherein the lower edge of the near-baseband passband is spaced from DC by a half-channel-spacing displaced from about an integer multiple of the channel spacing.

Claim 103 (new) The method of claim 54 wherein the lower edge of the near-baseband passband is spaced from DC by a half-channel-spacing displaced from an integer multiple of the channel spacing.

Claim 104 (new) The method of claim 65 wherein the lower edge of the near-baseband passband is spaced from DC by about 1.5 times the channel spacing.

Claim 105 (new) The method of claim 74 wherein the lower edge of the near-baseband passband is spaced from DC by an integer multiple of the channel spacing.

Claim 106 (new) The method of claim 74 wherein the lower edge of the near-baseband passband is spaced from DC by about the channel spacing.

Claim 107 (new) The method of claim 74 wherein the lower edge of the near-baseband passband is spaced from DC by about twice the channel spacing.